Claims

What is claimed is:

1. A method for treating a neurological condition characterized by dysfunction of nicotinic acetylcholine receptors comprising co-administering metanicotine, or a pharmaceutically acceptable salt or analogue thereof, and at least one compound exhibiting antagonistic activity, or both agonist and antagonist activity, toward one or more nicotinic acetylcholine receptor subtypes, to a patient in need of such treatment.

2. The method, according to claim 1, wherein the compound is selected from the group consisting of acetylcholine; nicotine; 3-[2,4-dimethoxybenzylidene]-anabaseine; 2-methyl-3-(2-(S)-pyrrolidinyl methoxy)pyridine; (S)-3-methyl-S-(1-methyl-2-pyrrolidinyl)isoxazole; (R)-5-(2-azetidinyl-methoxy)-2-chloropyridine; altinicline; (±)-4-{[2-(1-methyl-2-pyrrolidinyl) ethyl]thio}phenol hydrochloride; epibatadine; and mecamylamine, or a pharmaceutically acceptable salt or analogue thereof.

3. The method, according to claim 1, wherein the metanicotine and the compound are administered to the patient consecutively.

4. The method, according to claim 1, wherein the metanicotine and the compound are administered to the patient simultaneously.

5. The method, according to claim 1, wherein the metanicotine and the compound are administered to the patient simultaneously and in the form of a pharmaceutical composition.

6. The method, according to claim 1, wherein the neurological condition is selected from the group consisting of Alzheimer's disease, Parkinson's disease, Huntington's chorea, tardive dyskinesia, hyperkinesias, mania, attention deficit disorder, attention deficit hyperactivity disorder, sleep-wake disorder, chronic-fatigue syndrome, tremor, epilepsy, neuropathic pain, addiction, anxiety, dyslexia, schizophrenia, obsessive-compulsive disorder and Tourette's syndrome, or combinations thereof.

7. The method, according to claim 1, wherein the patient is suffering from the neurological condition.

8. The method, according to claim 1, wherein the route of administration is selected from the group consisting of intravenous, oral, and intra-nasal.

9. The method, according to claim 1, wherein the metanicotine and the compound administered to the patient do not cause an adverse side effect in the patient which is normally associated with administration of the compound alone, or wherein the metanicotine and the compound administered to the patient cause an adverse side effect in the patient which is normally associated with administration of the compound alone, but of decreased intensity.

10. The method, according to claim 1, wherein the metanicotine and the compound are administered in amounts sufficient to penetrate the blood-brain barrier.

11. A pharmaceutical composition comprising metanicotine, or a pharmaceutically acceptable salt or analogue thereof, and at least one compound exhibiting antagonistic activity, or both agonist and antagonist activity, toward one or more nicotinic acetylcholine receptor subtypes.

12. The pharmaceutical composition, according to claim 1, wherein said compound is selected from the group consisting of wherein the compound is selected from the group consisting of acetylcholine; nicotine; 3-[2,4-dimethoxybenzylidene]-anabaseine; 2-methyl-3-(2-(S)-pyrrolidinyl methoxy)pyridine; (S)-3-methyl-S-(1-methyl-2-pyrrolidinyl)isoxazole; (R)-5-(2-azetidinyl-methoxy)-2-chloropyridine; altinicline; (±)-4-{[2-(1-methyl-2-pyrrolidinyl) ethyl]thio}phenol hydrochloride; epibatadine; and mecamylamine, or a pharmaceutically acceptable salt or analogue thereof.

13. A method for modulating the activity of a compound upon a nicotinic acetylcholine receptor, wherein the compound has an antagonist, or a mixed agonist/antagonist, nicotinic acetylcholine receptor profile, said method comprising contacting the compound with metanicotine, or a pharmaceutically acceptable salt or analogue thereof.

14. The method, according to claim 15, wherein the metanicotine diminishes the antagonist activity of the compound upon a nicotinic acetylcholine receptor when the compound is contacted with the nicotinic acetylcholine receptor.

15. The method, according to claim 14, wherein the compound has one or more side effects that are reduced or eliminated after contacting the compound with the metanicotine.

16. The method, according to claim 13, wherein the compound is contacted with the metanicotine *in vitro*.

17. The method, according to claim 13, wherein the compound is contacted with the metanicotine *in vivo*.

18. The method, according to claim 14, further comprising contacting the compound with the nicotine acetylcholine receptor *in vitro*.

19. The method, according to claim 14, further comprising contacting the compound with the nicotine acetylcholine receptor *in vivo*.

20. The method, according to claim 13, wherein the compound is selected from the group consisting of acetylcholine; nicotine; 3-[2,4-dimethoxybenzylidene]-anabaseine; 2-methyl-3-(2-(S)-pyrrolidinyl methoxy)pyridine; (S)-3-methyl-S-(1-methyl-2-pyrrolidinyl)isoxazole; (R)-5-(2-azetidinyl-methoxy)-2-chloropyridine; altinicline; (±)-4-{[2-(1-methyl-2-pyrrolidinyl) ethyl]thio}phenol hydrochloride; epibatadine; and mecamylamine, or a pharmaceutically acceptable salt or analogue thereof.